

U.S. Nuclear Regulatory Commission

Sustainability Report and Implementation Plan

2020

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Executive Summary

The U.S. Nuclear Regulatory Commission (NRC) licenses and regulates the Nation's civilian use of radioactive materials to provide reasonable assurance of adequate protection of public health and safety, to promote the common defense and security, and to protect the environment.

NRC Headquarters in Rockville, MD, is comprised of two high-rise office buildings totaling 998,000 gross square feet (GSF): the One White Flint North (OWFN) facility, owned by the General Services Administration (GSA), and the Two White Flint North (TWFN) facility, owned by the Lerner Corporation and leased through the GSA. In addition, the NRC occupies office space that is managed by the GSA at the Three White Flint North (3WFN) building. The NRC's 2019 fleet (GSA-leased) consists of 13 gasoline/diesel and 14 flex-fuel vehicles.

Protecting the environment is vital to the NRC's mission, as reflected in the agency's commitment to incorporating strategies that promote sustainability into its daily operations.

The NRC continues to comply with the goals stated in Executive Order 13834, "Efficient Federal Operations," signed May 17, 2018, and views sustainability as an integral part of its business planning and decision-making.

1. FACILITY ENERGY EFFICIENCY

FY 2019 Energy Intensity Progress (Btu/GSF):

68.4 percent reduction from fiscal year (FY) 2003

1.8 percent reduction from FY 2018

FY 2020–FY 2021 Plan:

10 percent reduction in FY 2020 from FY 2019

2 percent reduction in FY 2021 from FY 2020

Implementation Status

The agency has implemented several energy savings strategies and continues to evaluate trends and identify other potential energy reduction measures. This effort has allowed the agency to meet its reduction target for energy intensity. In FY 2019, the NRC realized a 1.8 percent reduction in energy intensity in facilities compared to the FY 2018 and a 68-percent reduction in energy intensity compared to the FY 2003 baseline. Examples of energy saving strategies that have been implemented through the years which have contributed to the reductions stated above include:

- Improvements to TWFN, including the replacement of chillers with high efficiency magnetic bearing units and the incorporation of cross connect systems between the TWFN tenant and base chill water to enable single chiller to cool the entire building. Incorporation of water-cooled heat pumps into building HVAC and eliminating electric resistance heating. This allows for use of rejection heat from data closets/telephone rooms to heat office areas.
- Strict compliance with GSA recommended building operation guidelines regarding space temperature and occupancy schedules.

To capitalize on building lease terms and for future office space efficiencies, renovation of all 10 floors of the TWFN building was completed in 2019. Design specifications for the TWFN renovation project ensure that, when applicable, the contractor installs ENERGY STAR and energy-efficient equipment. The TWFN renovation project also incorporates several design features that are based on strategies and technologies proven to lower building electrical consumption. One focus area involves improved office lighting. New light-emitting diode (LED) light fixtures that are connected to office area occupancy sensors have been installed on every TWFN floor. Each floor was designed to use new technologies to implement light-harvesting techniques in office spaces. Light harvesting allows the agency to dim the LED light fixtures near the building envelope when sufficient natural lighting is available.

The TWFN renovation project has also improved the heating, ventilation, and air conditioning (HVAC) system. Each floor's large air-handling units were replaced with high-efficiency motors. New variable air volume units were installed. These units include digital controls and variable stage heating fan motors and will be controlled by the TWFN Building Management System to optimize energy consumption while maintaining office area comfort.

Three OWFN floors have also been updated with the improved LED lighting and controls, including light harvesting and other passive design features that optimize the use of natural lighting. This change was implemented based on energy saving design features.

In 2018, to support grid reliability and lower utility costs, the NRC enrolled in a demand response program. This program offers payments to businesses that agree to reduce their demand at times when the grid is under stress. In 2019, the NRC received the demand response dispatch notification several times, and NRC buildings reduced electricity usage based on the NRC's predefined energy reduction strategy, which ultimately helped reduce utility costs by \$29,000.

Priority Strategies & Planned Actions

The NRC will incorporate energy efficient strategies when planning building renovations in the future. Given the current COVID-19 crisis our buildings have been mostly unoccupied since March 2020 and we expect very low occupancy rates in the foreseeable future therefore, we expect a considerable reduction in energy demand in FY 2020.

2. EFFICIENCY MEASURES, INVESTMENT, AND PERFORMANCE CONTRACTING

FY 2019 Performance Contracting, Investment Value and New Projects awarded:

\$0/0 project in FY 2019

FY 2020–FY 2021 Plan:

\$0/0 project in FY 2020

\$0/0 project in FY 2021

Implementation Status

In 2019, the NRC was not involved in any Energy savings performance contracts (ESPCs) or utility energy service contracts (UESCs).

Priority Strategies & Planned Actions

The NRC has no plans to be involved in any Energy savings performance contracts (ESPCs) or utility energy service contracts (UESCs) in the foreseeable future.

3. RENEWABLE ENERGY

FY 2019 Renewable Electricity Use:

15 percent of total electricity in FY 2019

FY 2020–FY 2021 Plan:

15 percent of total electricity in FY 2020

15 percent of total electricity in FY 2021

Implementation Status

Currently, the NRC purchases its electricity using a GSA areawide contract. Through this agreement, 15 percent of the electricity that the NRC uses comes from renewable energy sources. In FY 2019, this amounts to approximately 1,575,642 kilowatt hours of energy. Agera Energy provides this renewable energy from wind resources in Texas.

Priority Strategies & Planned Actions

The GSA's areawide utility contract is a long-term contract; therefore, the NRC expects that for the foreseeable future, 15 percent of the electricity that the NRC uses will come from renewable energy sources.

4. WATER EFFICIENCY

FY 2019 Water Intensity Progress (gal/GSF):

56.7 percent reduction from FY 2007

7 percent reduction from FY 2018

FY 2020–FY 2021 Plan:

10 percent reduction in FY 2020 from FY 2019

2 percent reduction in FY 2021 from FY 2020

Implementation Status

The NRC has implemented several water-saving strategies and continues to evaluate water usage trends to identify other ways to reduce water consumption. As a result, the agency has reduced water use by more than 56.7 percent since the FY 2007 baseline. Examples of water saving strategies that have been implemented through the years that have contributed to the reductions stated above include:

- Installed sub-meters and monitor the water usage associated with irrigation. This allows the agency to detect leaks within the irrigation system as well as broken sprinkler heads and system malfunctions.
- Upgraded high-flow restroom fixtures with more efficient low-flow fixtures in all OWFN and TWFN restrooms.
- Installed chemical free cooling tower water treatment which reduced the need for blowdown.
- Upgraded cooling tower make-up water systems which included installing redundant alarms for cooling tower overflow.

Historically, one of the most significant sources of water consumption is wastewater associated with restroom use. To reduce the amount of water usage associated with wastewater, the NRC has focused on upgrading high-flow restroom fixtures to more efficient low-flow fixtures.

The NRC is also focused on more efficient HVAC operation methods throughout its facilities. By using submeters for the cooling towers, the NRC staff can more closely monitor water usage associated with the HVAC system. As a result, the agency has identified and corrected operational issues to reduce wasted water and control water chemistry with fewer chemicals. The NRC will continue to monitor water usage associated with the HVAC system and will remain proactive in reducing unnecessary water consumption during operation.

Another sustainability design feature included in the TWFN renovation project is the installation of a new filtered drinking water system with water fountains that are integrated with a water-bottle filler. The new water fountains are expected to reduce plastic bottle waste by the staff.

Priority Strategies & Planned Actions

The NRC will incorporate updated water saving-features in OWFN bathrooms, in correlation to water-saving features used in the upgraded TWFN building. Given the current COVID-19 crisis our buildings have been mostly unoccupied since March 2020 and we expect very low occupancy rates in the foreseeable future therefore, we expect a considerable reduction in water demand in FY 2020.

5. HIGH-PERFORMANCE SUSTAINABLE BUILDINGS

OWFN is owned by GSA and the building is part of GSA's building inventory for the high-performance sustainable buildings goal; therefore, this goal is not applicable to the NRC. The same applies to TWFN since it is also a leased facility.

Priority Strategies & Planned Actions

N/A

6. WASTE MANAGEMENT AND DIVERSION

FY 2019 Nonhazardous Waste Management and Diversion:

418.2 metric tons of nonhazardous solid waste generated*

31 percent diverted and 69 percent sent to treatment and disposal facilities

**not including construction and demolition waste*

FY 2020-FY 2021 Plan:

10 percent reduction in non-hazardous solid waste generated in FY20 from FY19

35 percent diverted and 65% sent to treatment and disposal facilities in FY20

5 percent reduction in non-hazardous solid waste generated in FY21 from FY20

40 percent diverted and 60% sent to treatment and disposal facilities in FY21

Implementation Status

The NRC continues to benefit from the robust recycling and waste diversion program implemented at its facilities. The agency educates its staff on the recycling program throughout the year using posters and bulletins. It also strives to make the recycling process as simple as possible for employees in order to encourage participation.

In 2019, the TWFN construction and renovation project produced approximately 173 tons of construction and demolition waste. Approximately 95 percent of this waste was recycled. The NRC expects this good practice to continue into the foreseeable future.

Priority Strategies & Planned Actions

The NRC plans to continue educating its staff on its recycling and waste diversion program and to continue simplifying the recycling process to keep the program successful.

1. TRANSPORTATION/FLEET MANAGEMENT

FY 2019 Petroleum Reduction Progress (Gal):

33 percent reduction in petroleum fuel since 2005

9.7 percent reduction in petroleum fuel since FY18

FY 2020-FY 2021 Plan:

2 percent reduction in FY20 from FY19

2 percent reduction in FY21 from FY20

FY 2019 Alternative Fuel Use Progress (Gal):

365 percent increase in alt fuel since 2005

18 percent increase in alt fuel since FY18

FY 2020-FY 2021 Plan:

2 percent increase in FY20 from FY19

2 percent increase in FY21 from FY20

Implementation Status

The NRC continuously measures and evaluates various approaches to increase the sustainability and efficiency of its fleet (GSA-leased). The NRC's 2019 fleet incorporated 13 gasoline/diesel and 14 flex-fuel vehicles. Specifically, NRC's 2019 fleet consists of 3 sport utility vehicles, 2 minivans, 3 heavy duty trucks and 19 cost-effective small size vehicles. Specific types of vehicles are required for the mail services, the warehouse storage and distribution services, and the emergency operations. The nineteen vehicles support the NRC's mission and are utilized by staff for official business, including travel to and from the following: (1) nuclear power plants for site visits, (2) vendor inspections, (3) training, and (4) public meetings. An E85 fueling station is available within a 5-mile radius of the NRC Headquarters buildings, and when possible, flex-fuel vehicles are refueled with E85 at this station. As of 2019, the NRC's efforts have led to a 42 percent reduction in fleetwide per-mile greenhouse gas (GHG) emissions compared to 2014 and 9% reduction compared to 2018. The NRC has increased its alternative fuel consumption by 365 percent since 2005.

Priority Strategies & Planned Actions

The NRC has reached its projected optimal inventory at this time and has increased the number of alternative fuel vehicles and reduced the number of conventionally fueled vehicles. It is significantly harder to find reductions in a small fleet like the NRC's. The NRC is continually looking at ways to reduce its fleet size and control costs. For example, the NRC terminated the executive driver service contract and plans to reduce its fleet by three to five vehicles in FY 2020.

1. SUSTAINABLE ACQUISITION/PROCUREMENT

FY 2019 Sustainable Acquisition Progress:

4.98 percent of contract actions and 5.32 percent of obligations (in dollars), for a total of \$9.7 million in contract actions with statutory environmental requirements

Implementation Status

The NRC has in place a Green Purchasing Plan (GPP), which contains Federal requirements and guidance for purchasing products and services that are safe and healthy for the public and the environment. According to the GPP, contracting officers are required to consider sustainable acquisition, including source selection factors, in acquisitions that may include energy- and water-efficient services and products, products and services that use renewable energy technologies, products containing recovered materials, bio-based products, environmentally preferable products and services, and non-ozone-depleting substances. According to data reported in the Federal Procurement Data System—Next Generation, 4.98 percent of all contract actions include statutory environmental requirements.

Also, as stated in the TWFN lease agreement, the building owner is required to meet certain product sustainability and environmental requirements when purchasing construction material to be used for the major renovations. For example, all carpets installed in the 10 renovated TWFN floors are made with 46 percent postconsumer recycled content and are designed to meet volatile organic content requirements for air quality. Also, all newly installed ceiling tiles are made with 76 percent recycled content.

Priority Strategies & Planned Actions

The NRC plans to continue using the GPP for sustainable acquisition and to comply with statutory environmental requirements.

2. ELECTRONICS STEWARDSHIP

**excluding exempted equipment*

FY 2019 Electronics Stewardship Progress:

100 percent of newly purchased or leased equipment met energy efficiency requirements

100 percent of electronic equipment disposed using environmentally sound methods*

**Reuse, donation, recycling, transfer, sale, or demanufacturing.*

Implementation Status

The NRC has a GPP in place that contains Federal requirements and guidance for purchasing products and services that are safe and healthy for the public and the environment. The GPP recommends using the Electronic Product Environmental Assessment Tool, which is a comprehensive environmental rating that helps identify greener computers and other electronic equipment that meet Federal requirements for purchase of energy efficient products.

Priority Strategies & Planned Actions

The NRC replaced all workstations in 2019. The new standard workstations consist of a laptop instead of the standard desktop configuration. The new laptops come with solid-state drives and latest generation processors, resulting in much faster performance and more energy savings. Also, all the new laptops will be power management enabled. The NRC plans to follow standard Federal practices for disposal of excess equipment as described in the GSA's Personal Property Disposal Guide.

Also, in 2019, the NRC installed meters in the Uninterruptible power supply room and the data center of 3WFN to support its Data Center Infrastructure Management software. These meters are required to create a power usage effectiveness (PUE) report, which will determine the energy efficiency of the 3WFN data center. The initial PUE calculation will be the baseline for any data center energy improvement efforts.

3. GREENHOUSE GAS EMISSIONS (GHG)

FY 2019 Scope 1 and 2 GHG Emissions:

77.1 percent reduction from FY 2008

23 percent reduction from FY 2018

Implementation Status

The FY 2019 accounting for Scope 1 and Scope 2 GHG emissions indicated a 77 percent decrease from the FY 2008 baseline (13,800 metric tons of carbon dioxide equivalent (MTCO₂e) in 2008 versus 3,166 MTCO₂e in 2019). The NRC has exceeded its initial reduction target goals for Scope 1 and Scope 2 GHG emissions of 4.4 percent by FY 2020. The significant decrease in Scope 1 and Scope 2 GHG emissions is a direct result of the NRC's aggressive energy savings program as described in the sections above.

Priority Strategies & Planned Actions

The NRC will continue to monitor energy consumption and will remain proactive in reducing unnecessary energy consumption.